

AMENDMENTS TO THE CLAIMS:

1-123 (Cancelled).

124. **(Currently amended)** A process for preparing a medical implant having an improved balance of wear properties and oxidation resistance comprising the steps of:

irradiating a preform of ultrahigh molecular weight polyethylene to form free radicals;

annealing the irradiated preform by heating in a substantially oxygen-free atmosphere at a temperature above about 150°C, for a time sufficient to recombine substantially all of the free radicals and cross-link the ultrahigh molecular weight polyethylene;

cooling the cross-linked preform while maintaining a substantially oxygen-free atmosphere;

forming a medical implant from the cross-linked preform;

~~packaging the medical implant in an air-permeable package;~~ and

sterilizing the ~~packaged~~ implant using standard means ~~non-irradiative methods~~.

125. **(Previously presented)** A process for preparing a medical implant having an improved balance of wear properties and oxidation resistance comprising the steps of:

irradiating a preform of ultrahigh molecular weight polyethylene to form free radicals;

annealing the irradiated preform by heating in a substantially oxygen-free atmosphere at a temperature above about 150°C, to cross-link the ultrahigh molecular weight polyethylene;

cooling the cross-linked preform while maintaining a substantially oxygen-free atmosphere;

forming a medical implant from the cross-linked preform.

126. **(Previously presented)** A medical implant prepared according to the process of claim 124.

127. **(Previously presented)** A medical implant prepared according to the process of claim 125.

128. **(Currently amended)** A cross-linked ultrahigh molecular weight polyethylene **(UHMWPE)** having a swell ratio of less than about 5 and ~~an oxidation level of less than about 0.2 carbonyl area/mil sample thickness after aging the ultrahigh molecular weight polyethylene at 70°C, for 14 days in oxygen at a pressure of about 5 atmospheres~~ has a degree of oxidation ranging from about 0.01 to about 0.15 at a depth of between about 20 μ m to about 3 mm of the cross-linked UHMWPE.

129. **(Previously presented)** A medical implant comprising the ultrahigh molecular weight polyethylene of claim 128.

130. **(Currently amended)** A process for preparing a medical implant having an improved balance of wear properties and oxidation resistance comprising the steps of:

irradiating a preform of ultrahigh molecular weight polyethylene to form free radicals;

annealing the irradiated preform by heating at a temperature above about 150°C, for a time sufficient to recombine substantially all of the free radicals and cross-link the ultrahigh molecular weight polyethylene;

cooling the cross-linked preform;

forming a medical implant from the cross-linked preform;

~~packaging the medical implant in an air-permeable package;~~ and

sterilizing the ~~packaged~~—implant using standard means non-irradiative methods.

131-142 (Cancelled).

143. **(Currently amended)** A process for preparing a medical implant having improved mechanical properties, wherein the method comprises:

irradiating a polyethylene article to form free radicals; **and**

heating the polyethylene article to a temperature at or above the melting point such that the free radicals can recombine, thereby forming a cross-linked polyethylene article;

forming an implant from the cross-linked polyethylene article; and

sterilizing the implant using standard means.

144. **(New)** The process according to claim 143, wherein the standard means for sterilizing the implant include heat.

145. **(New)** The process according to claim 124, wherein the standard means for sterilizing the implant include heat.

146. **(New)** The process according to claim 130, wherein the standard means for sterilizing the implant include heat.